GUIDING TRAINING IN GYM APPLICATION FOR BEGINNER BASED ON ANDROID MOBILE UNIVERSITAS MUHAMMADIYAH SURAKARTA

Compiled as a condition completing Bachelor Degree Program at the Department of Informatics, Faculty of Communication and Informatics

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DEPARTMENT OF INFORMATICS

FACULTY OF COMMUNICATION AND INFORMATICS

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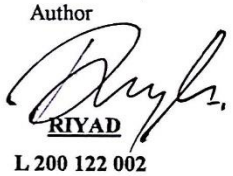

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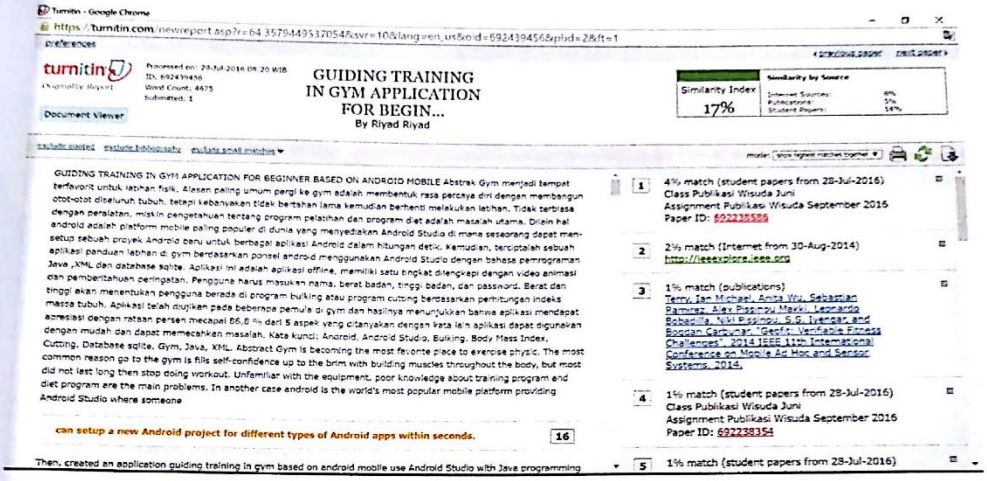

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Then, created an application guiding training in gym based on android mobile use Android Studio with Java programming

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GUIDING TRAINING IN GYM APPLICATION FOR BEGINNER BASED ON ANDROID MOBILE

Abstrak

Gym menjadi tempat terfavorit untuk latihan fisik. Alasan paling umum pergi ke gym adalah membentuk rasa percaya diri dengan membangun otot-otot diseluruh tubuh, tetapi kebanyakan tidak bertahan lama kemudian berhenti melakukan latihan. Tidak terbiasa dengan peralatan, miskin pengetahuan tentang program pelatihan dan program diet adalah masalah utama. Dilain hal android adalah platform mobile paling populer di dunia yang menyediakan Android Studio di mana seseorang dapat men-setup sebuah proyek Android baru untuk berbagai aplikasi Android dalam hitungan detik. Kemudian, terciptalah sebuah aplikasi panduan latihan di gym berdasarkan ponsel android menggunakan Android Studio dengan bahasa pemrograman Java ,XML dan database sqlite. Aplikasi ini adalah aplikasi offline, memiliki satu tingkat dilengkapi dengan video animasi dan pemberitahuan peringatan. Pengguna harus masukan nama, berat badan, tinggi badan, dan password. Berat dan tinggi akan menentukan pengguna berada di program bulking atau program cutting berdasarkan perhitungan indeks massa tubuh. Aplikasi telah diujikan pada beberapa pemula di gym dan hasilnya menunjukkan bahwa aplikasi mendapat apresiasi dengan rataan persen mecapai 86,8 % dari 5 aspek yang ditanyakan dengan kata lain aplikasi dapat digunakan dengan mudah dan dapat memecahkan masalah.

Kata kunci: Android, Android Studio, Bulking, Body Mass Index, Cutting, Database sqlite, Gym, Java, XML.

Abstract

Gym is becoming the most favorite place to exercise physic. The most common reason go to the gym is fills self-confidence up to the brim with building muscles throughout the body, but most did not last long then stop doing workout. Unfamiliar with the equipment, poor knowledge about training program and diet program are the main problems. In another case android is the world's most popular mobile platform providing Android Studio where someone can setup a new Android project for different types of Android apps within seconds. Then, created an application guiding training in gym based on android mobile use Android Studio with Java programming language, XML and Database sqlite. This application is offline application, having one level equipped with animation video and alert notification. User must input name, weight, height, and password. Weight and height will determine user are in bulking program or cutting program based on body mass index calculation. The application has been tested on some beginners in gym and the result show that our application got appreciation with the average percent reached 86,8% of five aspects was asked with another word the application can be deployed easily and can solve problems.

Keyword: Android, Android Studio, Bulking, Body Mass Index, Cutting, Database sqlite, Gym, Java, XML.

1. INTRODUCTION

Gym short for gymnasium, is an open air or covered for gymnastic and athletics and gymnastics services such as in schools and colleges, from the ancient Greek gymnasium. Along the increasing complexity of sport, nowadays the meaning of gym is as media that provide many kind solution, start from healthy consultation until bodybuilding.

Gym has become the first choice of places to do exercise physic. Fitness is becoming lifestyle in all circles and ages. Having a nice body is the main reason people are going to go and join a gym in the first place. Literally millions of people work out every day, very few realize true workout success. Most dabble in the gym on and off, never getting results. There are three main problems that caused it happened firstly, having poor understanding how to use the dumbbell, barbell and machine in the gym. The secondly, don't know how to program the training. In our body there are 4 big muscle (shoulders, chest, wings, and leg) that must be trained in a programmed. The thirdly, missing the diet equation to make bodybuilding come from 70% food and 30% training. Actually in gym there are personal trainers who are fitness professional involved in exercise prescription and instruction. Trainers also measure their client's strengths and weaknesses with fitness assessments but certainly there will be payment for that and it will be problem for some people that have limited money.

To overcome those problems, created an application guiding training in gym based on android mobile use Android Studio with java programming language for system, XML for design and Database sqlite. Goal of this research is create an application based on android mobile that will overcome problems that arise among beginners in the gym so can optimize the workout and get a diet program that's clear and easy to understand so tcan achieve the desirable body. Benefit of this research users get a very clear explanation on each of the exercises with arranged scheduled and get a diet program that is easy to understand in order to minimize their failure to achieve the target. And then benefit for researchist is can implemented the knowledge that have been get in study, especially about android mobile programming and Java programming language.

Ian Michael Terry, Anita Wu, Sebastian Ramirez, Alex Pissinou Makki, Leonardo Bobbadila, Niki Pissinou, S.S Iyengar and Bogdan Carbunar (2014) in their research titled Geofit: Verifiable Fitness Challenges said the tight integration of mobile devices and apps into our daily routine impacts our approach to health. In this paper aim to integrate fitness challenges into the daily routine of users, in order to motivate them to participate more frequently. Develop GeoFit, a mobile app that enables users to discover and add novel fitness challenges in their proximity. Our experimental results show that the

GeoFit client imposes only little overhead on the user device, while the server side can support hundreds of client interactions per second.

Bhavani Ahilan (2015) in his research titled Comparison of Body composition among different Level of Students said body composition is defined as the proportion of fat, muscle, and bone in the body. It is usually given as a ratio of lean mass to fatty mass. Body composition will normally be expressed as either a percentage of fat or as a percentage of lean body mass. In this study one of health related physical fitness variablenamely body composition (Percent Body Fat) is selected as criterion variable.

Kelian Gali Untung (2014) in his research titled Pembangunan Aplikasi Panduan Fitness Interaktif Menggunakan Teknologi Augmented Reality Berbasis Mobile said that Fitness is sport use weights with particular movement technic with the goal to build muscle so can get the proportioned body. But still many people cannot get information about the way to use the weights or the movement with right training method. In line with the technology development in hand phone as media information sharing, making an application guiding fitness based android that built used Augmented Reality Technology use unity tools and Java programming language.

Pungky Ary Wibowo (2015) in his research titled Aplikasi Augmented Reality Game Edukasi Untuk Pengenalan Organ Tubuh Manusia said Human organs is a vital instrument in the human body. In practice, the introduction of human organs in primary school in need of a 3-dimensional props are only owned by the school. While primary school children to be interested in new things. Therefore it takes innovation to bridge both these problems with the application of augmented reality educational game to interest and assist students in human organs.

2. MATERIAL AND METHOD

There are six methods that used in this research firstly, Literature Review Method is make review to the researchs, papers, books, articles, about gym, fitness, training program in gym, diet program, android especially for android programming from internet. Secondly, Gathering Information is make interview directly with personal trainer in gym and for

programming make interview with mr Bana as supervisor. Thirdly, Necessary Analysis is make analysis to the things that are needed and also the data that are needed to build this application. Fourthly, Design Built System is descripting how this application can guide the user in exercise and diet program set so as to achieve the target. Fifthly, Implementation is implementing the system that have designed into computer programs. Program to support making android mobile application (Android Studio). And the last one is writing The Report.

Time that have used to finish this research started on November 2015 and have finished on April 2016 at Universitas Muhammadiyah Surakarta, Asia Fitness Center and researchist home. Tools that used during research is divided by two category are hardware and software. Hardware that used are laptop with specification processor Intel(R) Core(TM) i3-2328M CPU @2.20GHz (4CPUs),~2,2GHz, memory 4048MB RAM with operating system Windows 8.1 Enterprise 32-bit and mobile phone Galaxy Samsung Ace 3. While software that used to make this application are Android Studio and Google Chrome. Materials that used in this research are beginners in the gym where make research, and articles, papers, books from internet.

2.1 System Design

The system design includes the creation of design or system design by using the diagram in the *Unified Modeling Language (UML)*. Diagram used were: *use case diagram, class diagram, sequence diagram,* and *activity diagram*. The following UML design is done. Use case diagram represent an interaction between actors with the system, as illustrated in Figure 1 related to interaction between user and system. And *class diagram* showed in Figure 2.

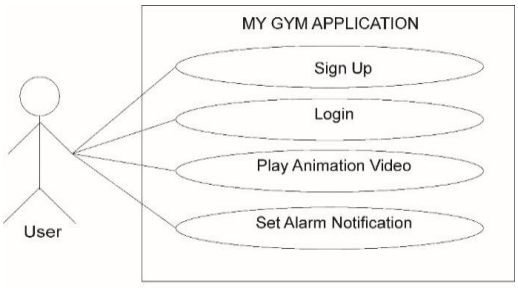

Figure 1. *Use Case Diagram*

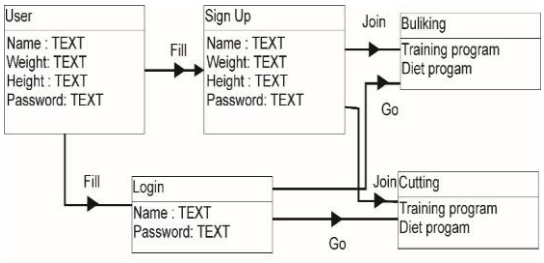

Figure 2. *Class Diagram*

There are four sequence diagrams in my application. *Sequence diagram* Sign up shows when user *sign up* like in Figure 3. Started with fill *sign up* data like *name, weight, height, password* and *confirm password*, if *password* and *confirm password* match the data will save inside database and user will go to the main page but if don't match those process will not run. *Sequence diagram* Login shows when user *login* like in Figure 4. Started with fill *login* data like *name* and *password*, if *name* and *password* match with *database* user will go to the main page but if don't match user still stay in *login* page.

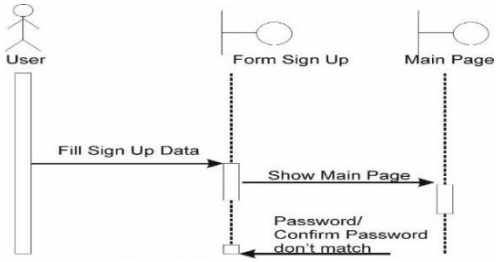

Figure 3. *Sequence Diagram* Sign Up

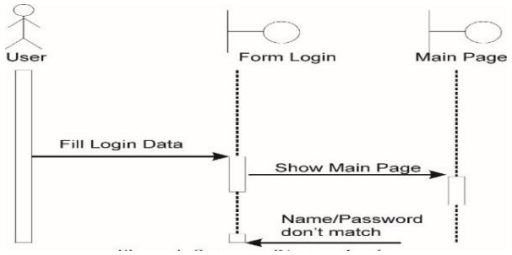

Figure 4. *Sequence Diagram* Login

Sequence diagram play animation video training shows when user plays animation video training like in Figure 5. User gets schedule in training page both of *bulking* and *cutting*, user can choose training day as user wants and choose one training. User will go to training page that user choose to see the rules and animation video training. Animation video training directly will be played. *Sequence diagram* set alarm notification diet shows when user sets alert notification diet like in Figure 6. Inside diet page, user have six time (*breakfast, snack after breakfast, lunch, snack after lunch, dinner* and *after training*) to eat. User choose one of them and will go to the diet food menu, then user click on set button alert and will go to alert page to set time as he wants.

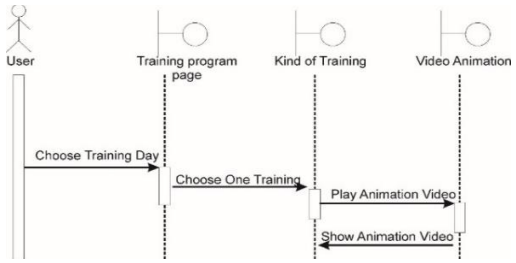

Figure 5. *Sequence Diagram* Play Animation Video Training

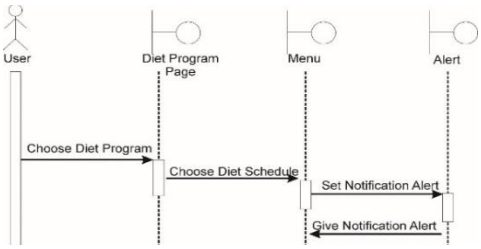

Figure 6. *Sequence Diagram* Set Notification Alert

Activity diagram sign up shows activity when user sign up to the application as illustrated in Figure 7. Activity diagram login shows activity when user login to the application as illustrated in Figure 8.

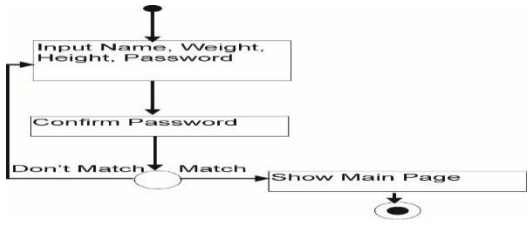

Figure 7. *Activity Diagram* Sign Up

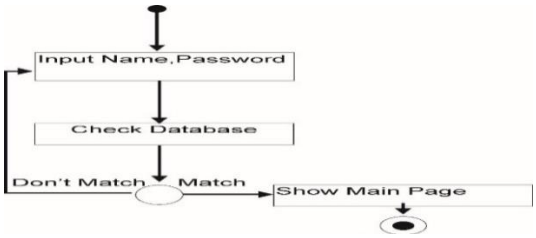

Figure 8. *Activity Diagram* Login

Activity diagram play animation video training shows activity when user plays animation video training as illustrated in Figure 9. Activity diagram set alert notification diet shows activity when user set alert notification diet as illustrated in Figure 10.

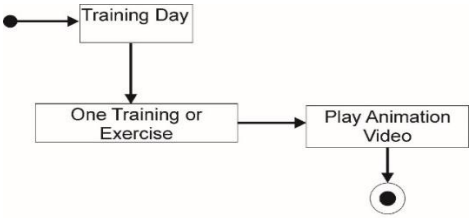

Figure 9. *Activity Diagram* Play Animation Video Training

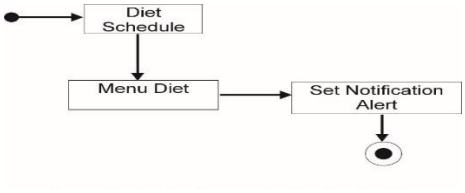

Figure 10. *Activity Diagram* Set Notification Alert

2.2 Implementation

To create this application the first thing that have to do is to draft a design such as what the user interface display, take one example as illustrated in Figure 11 is draft of design process when bulking login button pressed, the display will move to the login bulking display.

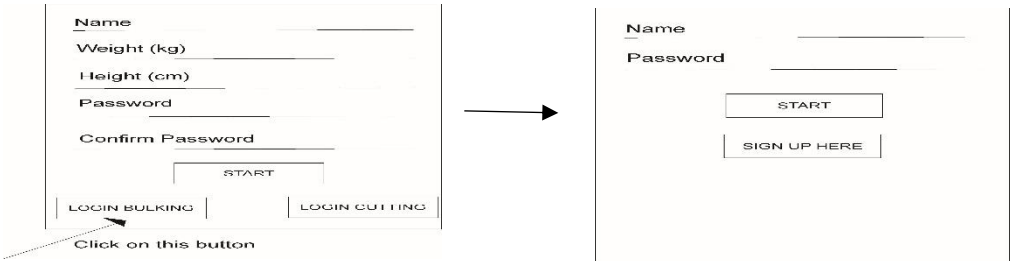

Figure 11. Design of User Interface Display

Created draft design using CorelDraw and some drawing on paper by hand after all the draft design finished apply to the Android studio. After that created the project in Android studio, the first thing to do is create a page layout for our application using XML based the draft design have created like in Figure 12 is an xml code for the login bulking button.

```
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="LOGIN BULKING"
    android:id="@+id/buttonlb"
    android:visibility="visible"
    android:layout_below="@+id/button"
    android:layout_toLeftOf="@+id/button"
    android:layout_toStartOf="@+id/button"
    android:background="@drawable/colorbutton"/>
```

Figure 12. Implementation XML code

To perform these functions use Java programming language as illustrated in Figure 13.

```
lb= (Button)findViewById(R.id.buttonlb);
lb.setOnClickListener((v) → {
        Intent i = new Intent(getApplicationContext(),login.class);
        startActivity (i) ;

});
```

Figure 13. Implementation Java Programming language

The final step is try to run the above script in the simulator or directly on our mobile phones. That's how the implementation process of creation of this application with take an example the work process bulking login button.

3. RESULT AND DISCUSSION

3.1 Research Result

Research result is produce an android application for guiding beginner in gym. In accordance with the design stage the look of this application took a few display. First sign up and login display. Sign up display contain data that must to be filled by user like name, weight, height, and password. Especially for weight and height will determine training and diet programs user based on Body Mass Index calculation where the formula according to

dickson in his article written in 2016 in ilmupengetahuan.com is BMI = Weight (kg) / Height (m)* Height (m). Then, the conditions are created if BMI less than 24 user will join to bulking program else will join to cutting program. And in the bottom of this display there are three button, first start button it used to sign up to the application after user fill the data, second login bulking button it used to go to the login bulking display and third login cutting button it used to go to the login cutting display. Sign up display can be seen in Figure 14. Login display is display will appear after click on login bulking button or login cutting button. This display contain data that must to be filled like name and password when user want to login to the application but before it make sure that user have make sign up before. There are two button in this display, first start button it used to login to the application and second sign up here button it used to back to sign up display. Login display can be seen in Figure 15.

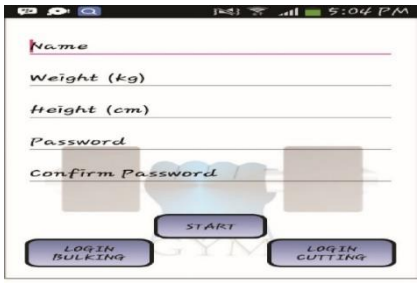

Figure 14. Sign Up Display

Figure 15. Login Display

Second main page display and animation video training display. Main page display is display will appear after user sign up or login. This display will welcome user by saying *"Welcome …… (username) This is My Gym, you are in Bulking/ Cutting program so enjoy it"*. There are three button in this display, first bulking/cutting training button it used to go to training schedule display, second bulking/cutting diet button it used to go to diet schedule display and third exit button it used to go out from main page application and will be back to sign up display. Especially for exit button after click on exit button will appear toast dialog *"are you sure?"* if click on yes will go out from main page and alert notification diet that have set before will be off. Main page display can be seen in Figure 16. Animation video training display contain the rules training and animation video training.

There is play button above animation video it used to replay animation video training. Training explanation and animation video display can be seen in Figure 17.

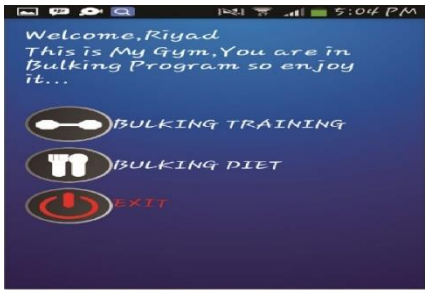

Figure 16. Main Page Display

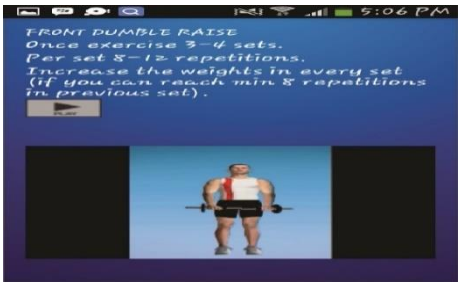

Figure 17. Animation Video Training Display

Third set notification display and notification display. Set notification display contain analog clock and set alert button. Analog clock it used to show the time and set alert button is used to set time when user want to turn on the notification. Set notification alert display can be seen in Figure 18. Notification display is notification will appear as user set the time in set notification alert display and when user click on those notification it will go to menu diet display. Notification display can be seen in Figure 19.

Figure 18. Set Notification Alert Display

Figure 19. Notification Display

3.2 Testing

In testing this study used three methods: *black box* method, tested in some version of the android operating system, and testing applications to some of fitness member in Pusat Kebugaran Asia.

Table1. System Testing by the method of Black Box

No	Description	Testing Procedure	Output	Result
1	Sign Up	Fill Sign Up Form(Input Name, Weight, height, and Password) and Klick Start Button	Appear Main Page Display	Success
2	Login	Fill Login Form (Input Name and Password) and Klick Start Button	Appear Main Page Display	Success
3	Weight and Height determine program (Bulking/ Cutting) based on Body Mass Index Calculation	Check User which BMI in accordance with the Program (BMI of less than 24 join Bulking if more than 24 join Cutting)	BMI User in accordance with the Program	Success
4	See Training Schedule	Click on Bulking / Cutting Training Button	Appear Bulking / Cutting Training Display	Success
5	See Diet Schedule	Click on Bulking / Cutting Diet Button	Appear Bulking / Cutting Diet Display	Success
6	See Miscellaneous Training in One Day	Click on One of Training Schedule Button	Appear Miscellaneous Training in One Day Display	Success
7	See Training Explanation and Animation Video	Click on One of Training in Miscellaneous Training in One Day Display	Show Training Explanation and Animation Video Display	Success
8	Play Animation Video Training	Click on Button Play	Animation Video Training replay	Success
9	See Menu Diet	Click on One of Mealtime in Diet Schedule Display	Appear Menu Diet Display	Success
10	See Set Notification Alert Display	Click on Set Notification Alert Button on Menu Diet Display	Appear Set Notification Alert Display	Success
11	Set Notification Alert	Click on Set Alert on Set Notification Alert Display and Set The Time	Appear Notification According To the Time Set	Success

Testing the system using *black box* method is a method of software **testing** that examines the functionality of an application without peering into its internal structures or workings. Ask someone to test the application in accordance with testing procedure are shown in Table 1. In the table 1, obtained that the entire function on android applications run properly. Therefore, it can be ascertained that the android app does not have an error in logic. Further testing is testing with the android operating system with a different version.

Applications that have been made will be tested in some version of the android operating system, the goal is to know whether the application can run well on all android versions. The results of these trials can be seen at Table 2.

Table 2. Tests on the Android Operating System

No	Testing	Android Operation System versions				
		Gingerbread	Ice Cream Sandwich	Jelly Bean	Kitkat	Lollipop
1	Display	Not Good	Good	Good	Good	Good
2	Loading Speed	Fast	Fast	Fast	Fast	Fast
3	Compatibility	Good	Good	Good	Good	Good
4	Button Function	Good	Good	Good	Good	Good
5	Error Rate	Low	Low	Very Low	Very Low	Very Low
6	Stability	Stable	Stable	Stable	Stable	Stable

Description : Display = Good : More than 80% the same as the display layout view in Android Studio, Not Good : Less than 80 % the same as the display layout view in Android Studio. Loading Speed = Fast : Less than 0,5 second loading speed, Slow : 0,5 - 2 second loading speed, Very Slow : More than 2 second loading speed. Compatibility = Good : More than 90 % The Application can run properly, Not Good : less than 90 % The Application can run properly. Button Function = Good : More than 90 % Button Function can run properly, Not Good : Less than 90 % Button Function can run properly. Error Rate = High : 50% - 100% of all functionality does not work, Low = 5 % - 50% of all functionality does not work, Very Low : Less than 5 % of all functionality does not work. Stability = Stable : Less than 5% chance of closing the application itself, Unstable : More than 5 % chance of closing the application itself.

From Table 2, we can get data that Guiding in Training Gym Application based on android mobile run well in the android version of Gingerbread, but the resulting display is not so good. In android Ice Cream Sandwich version the application can run pretty well. In android version Jelly Bean android application can run well and all functions can also be used. In the version of android Kitkat and Lollipop android application runs well and fast. The conclusion is Guiding Training in Gym Application based android mobile can run well on Android version Ice Cream Sandwich or above.

The testing phase of the operating system is done, the next process is testing applications to some of fitness member in Pusat Kebugaran Asia. Give questionnaire to fitness member Pusat kebugaran Asia especially to beginner and ask to try the application that already made, it aims to find out their opinion. The test is taken by 25 respondents from fitness member Pusat kebugaran Asia. Table 3 explain the results of the questionnaire with the following assessment P1 : Application easy to operate, P2 : Application can guide properly ,P3 : Interesting application display, P4 : Application is complete and P5: All functions are running properly.

Table 3. Results List of The Questionnaire

No	Name	Fitness for how long (Month)	Assessment				
			P1	P2	P3	P4	P5
1	Iwan	5 Month	5	5	5	5	5

No	Name	Fitness for how long (Month)	Assessment				
			P1	P2	P3	P4	P5
2	Matheus	6,5 Month	4	3	5	3	5
3	Fraky	8 Month	4	4	4	4	4
4	Tata	12 Month	5	3	3	3	5
5	Andrias	8 Month	4	3	3	4	5
6	Matt	7 Month	4	4	4	3	3
7	Affan Ali S.	6 Month	5	5	5	5	5
8	Candra	3 Month	4	5	4	4	5
9	Arief	5 Month	4	4	4	4	4
10	Meike	1 Month	5	5	4	4	5
11	Rio	10 Month	4	3	4	4	5
12	Hery	5 Month	4	3	3	3	5
13	Sapto	7 Month	4	5	4	4	5
14	Husin	9 Month	5	4	4	5	5
15	Fajar	10 Month	4	4	4	5	5
16	Arga	2 Month	4	4	3	3	5
17	Hananto W.H	4 Month	5	5	5	5	5
18	Erfan	4 Month	5	5	5	5	5
19	Danny	3 Month	4	5	3	4	5
20	Claudio	7 Month	5	5	4	3	4
21	Adam	1 Month	4	4	4	4	4
22	Dian	2 Month	5	5	5	5	5
23	Erlin	2 Month	4	3	4	5	3
24	Boy	5 Month	5	4	3	5	5
25	Ferdinand	4,5 Month	5	5	5	5	5

Graphic display results of the questionnaire can be seen in the Figure 20.

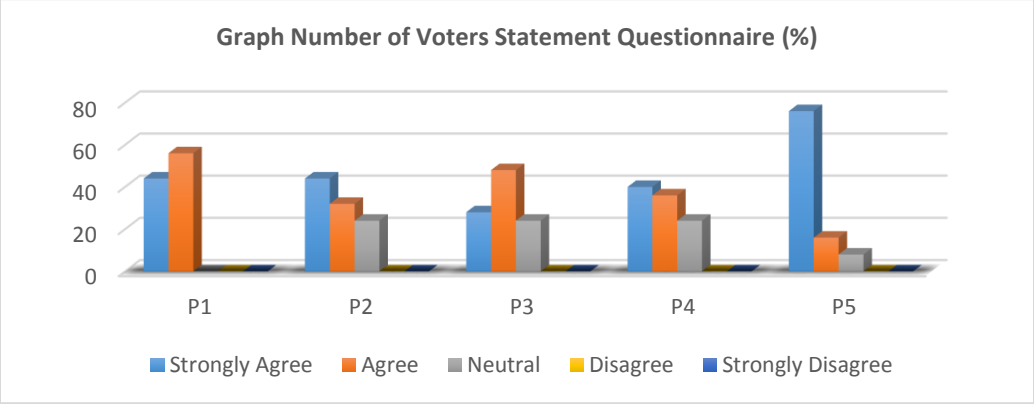

Figure 20. Graph Voters Turnout Questionnaire Statement

Table 4 explain the calculation results Score (S) and the percentage of Interpretation (P) to the questionnaire statement.

Table 4. Calculation Result Score (S) and the percentage of Interpretation (P)

No	Statements	Statement and Amount of answer					Total Score (S)	Interpretation percentage (P)
		SA (5)	A (4)	N (3)	D (2)	SD (1)		
1.	P1	11	14	0	0	0	111	88,8%
2.	P2	11	8	6	0	0	105	84%
3.	P3	7	12	6	0	0	101	80,8%
4.	P4	10	9	6	0	0	104	83.2%
5.	P5	19	4	2	0	0	117	93,6%

Display graph interpretation percentage of questionnaire statement like in Figure 21.

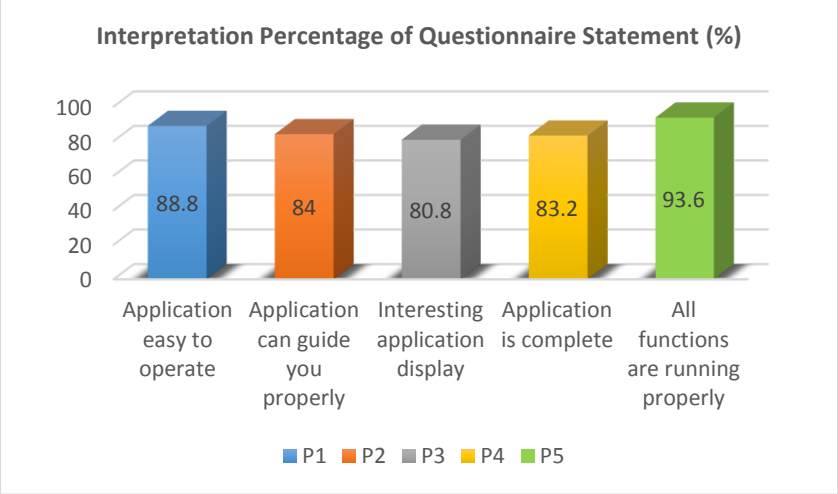

Figure 21. Graph of interpretation percentage questionnaire statement

From the statement Application easy to operate (P1) explained that the 11 respondents stated strongly agree (SA) and 14 respondents agree (A). The statement resulted interpretation percentage amounted to 88.8%, so it can be concluded the respondents stated that the application is very easy to use. From the statement Application can guide properly (P2) explained that 11 respondents stated strongly agree (SA), 8 respondents agree (A) and 6 respondents neutral (N). The statement resulted interpretation percentage amounted to 84%, so it can be concluded the respondents stated that the application can guide the very right. From the statement Interesting application display (P3) explained that 7 respondents stated strongly agree (SA), 12 respondents agree (A) and 6 respondents neutral (N). The statement resulted interpretation percentage amounted to 80,8%, so it can be concluded the respondents stated that the application display is very interesting.From the statement Application is complete (P4) explained that 10 respondents stated strongly agree (SA), 9 respondents agree (A) and 6 respondents neutral (N). The statement resulted interpretation percentage amounted to 83,2%, so it can be concluded the respondents stated that the

application is very complete. From the statement All functions are running properly (P5) explained that 19 respondents stated strongly agree (SA), 4 respondents agree (A) and 2 respondents neutral (N). The statement resulted interpretation percentage amounted to 93,6%, so it can be concluded the respondents stated that all functions on this application are running very well.

The graph in Figure 21 can be made the benchmark on attention and satisfaction of respondents Pusat Kebugaran Asia to android application that have been made, hopefully in the future application that have been created can provide many benefits to its users.

3.3 Analysis

Guiding training in gym application for beginner based on android mobile that has been made has advantages and disadvantages compared to other fitness apps. Advantages this application compared to other fitness apps are support in various versions of android from Ice Cream Sandwich until thereon, can be easily understood by user because determining the exercise program and a diet based on weight and height of the user by performing calculations based on body mass index (BMI) and there is a alert meal times in the form notification that I had never encountered in other fitness apps.

Disadvantages this application compared to other fitness apps are there are some movements are not in training program because of limited animation video, less varied meal on menu diet program and can not save time yet alert notification to the database application.

4. CONCLUSION

Guiding training in gym application for beginner based on android mobile is a solution that made researchist on the problems that arise for beginners in the gym as it has been delivered at the beginning by providing a program of exercise and diet adjusted body mass index of users and include alerts meals in the form of notification that was developed using the Java programming language ,XML and Database sqlite in Android studio.

This application is intended for multi-user that stored in the database sqlite. Hopefully in future, these applications can be developed with the capability of storing the

alert notification to the database. From the test results can be concluded that this application could be helpful for people who have no experience in the gym.

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